Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original) A method of communicating within a motion control system, said method comprising the steps of:

programming a plurality of drive cards to perform predetermined mathematical and logical functions in response to high-level commands;

configuring each of said plurality of drive cards with a respective unique predetermined delay time;

distributing intelligence throughout said motion control system by electrically interconnecting each of said plurality of drive cards with a local area network, each of said plurality of drive cards being further electrically connected to a corresponding component of said motion control system;

transmitting to said plurality of drive cards said high-level commands across said local area network;

delaying response to said high-level commands by each respective one of said plurality of drive cards according to said unique predetermined delay time;

responding to said high-level commands by each of said plurality of drive cards following the expiration of said unique predetermined delay time; and

temporarily suspending communication over said local area network following response by said plurality of drive cards to said high-level commands to thereby ensure deterministic communication over said local area network.

2. (original) The method of communicating within a motion control system of claim 1, wherein said local area network comprises an Ethernet network.

3. (original) The method of communicating within a motion control system of claim 1, wherein each said drive card includes a network controller, microprocessor, packet memory, memory, and firmware.

4. (original) The method of communicating within a motion control system of claim 1, wherein each of said transmitting step and said responding step comprise the transmission of data packets across said local area network.

5. (original) The method of communication within a motion control system of claim 4, wherein said transmitting step comprises a personal computer transmitting said data packets.

6. (original) The method of communicating within a motion control system of claim 5, wherein said personal computer includes an operating system, said operating system being one of a non-real-time operating system and a real-time operating system.

7. (original) The method of communicating within a motion control system of claim 6, wherein said personal computer includes motion control software running under said operating system.

8. (original) The method of communicating within a motion control system of claim 4, comprising the further step of selectively storing within each of said plurality of drive cards said transmitted data packets.

9. (original) The method of communicating within a motion control system of claim 8, comprising the further step of monitoring with said personal computer the level of transmitted data packets stored within each of said plurality of drive cards.

10. (original) The method of communicating within a motion control system of claim 9, comprising the further steps of :

establishing upper and lower trigger points for the level of transmitted data packets stored within each of said plurality of drive cards;

comparing the level of transmitted data packets stored within each of said plurality of drive cards with said upper and lower trigger points; and

adjusting the rate at which data packets are transmitted to each of said plurality of drive cards dependent at least in part upon said comparing step.

11. (original) The method of communicating within a motion control system of claim 1, comprising the further step of establishing promiscuous peer-to-peer communication within said local area network whereby the responses of each respective one of said plurality of drive cards to a high-level command is received by each of the others of said plurality of drive cards.

12. (original) The method of communicating within a motion control system of claim 11, comprising the further steps of:

storing within each respective one of said plurality of drive cards the responses to said high-level commands from each of the others of said plurality of drive cards;

determining the relevance of each of the responses stored within each of said plurality of drive cards; and

discarding non-relevant responses stored within each of said plurality of drive cards.

Claims 13-20 (cancelled)

21. (new) A networked distributed motion control system, comprising:

a local area network;

a personal computer electrically connected to said local area network, said personal computer having an operating system with an inherent latency time of a maximum duration;

a drive card interconnected to said local area network;

a plurality of data packets to control said drive card, said plurality of data packets being sent by said personal computer over said local area network to said drive card and being stored in memory is said drive card, said data packets being taken from said memory by circuitry in said drive card while leaving at least some of said data packets in said memory; and

wherein the number of data packets stored in said memory of said drive card being periodically monitored by said personal computer and additional data packets being sent to said drive card depending on said number of said data packets stored in said memory when said number of said data packets was monitored.

22. (new) The networked distributed motion control system of claim 21 wherein said personal computer calculates the number of data packets required to sustain said drive card during said latency period and transmits said number of said data packets to said drive card in a plurality of transmissions.

23. (new) The networked distributed motion control system of claim 21, wherein said drive card includes a respective network controller, microprocessor, packet memory, memory, and firmware.

24. (new) The networked distributed motion control system of claim 21, further comprising at least one of a motor and an input/output device

interconnected to said drive card, the operation of said one of a motor and an input/output device being responsive to said data packets.

25. (new) The networked distributed motion control system of claim 21, wherein said operating system being one of a non-real-time operating system and a real-time operating system.

26. (new) The networked distributed motion control system of claim 21, further comprising a motor and drive subassembly coupled to said drive card, said motor and drive assembly including a housing, blocks of insulative material being mounted to said housing, a respective one of said at least one motor and a corresponding one of said at least one drive card are mounted within said housing, said drive being mounted to said blocks of insulative material.

27. (new) A method of communicating within a motion control system between a master computer and a drive card, said master computer having an operating system with an inherent latency time of a maximum duration, said method comprising the steps of:

transmitting a plurality of data packets to said drive card said data packets providing operating instructions to said drive card;

storing at least some of said data packets in memory in said drive card;

retrieving stored data packets from said memory by said drive card while leaving at least some of said data packets in said memory;

detecting the number of said data packets in said memory by said master computer; and

transmitting additional data packets to said drive card by said master computer wherein the number of said additional data packets depends on said number of said data packets detected in said detecting step.

28. (new) The method of communicating within a motion control system of claim 27, comprising the further steps of:

calculating the number of data packets required to sustain said drive card during said latency period; and

transmitting said number of said data packets to said drive card in a plurality of transmissions.

29. (new) The method of communicating within a motion control system of claim 27, comprising the further steps of :

establishing upper and lower trigger points for the level of data packets stored within said drive card;

comparing the level of data packets stored within said drive card detected by said master computer with said upper and lower trigger points; and

adjusting the rate at which data packets are transmitted to said drive cards dependent at least in part upon said comparing step.